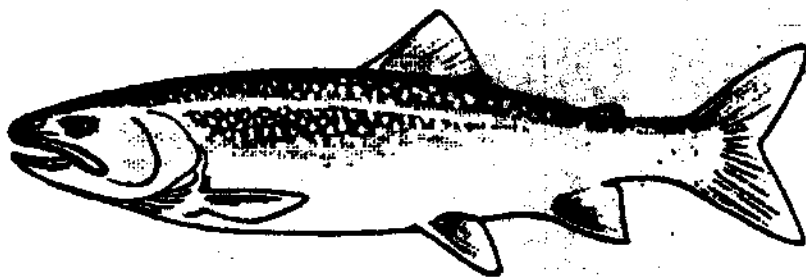


****ATTENTION****

This document is provided for historical purposes only.

Documents contained in the Washington Department of Fish and Wildlife Document & Publication Archive may contain dated and/or incorrect information. The WDFW Document & Publication Archive is provided as a service to those interested in the history of fish and wildlife management in Washington State.



Fish Diseases of the Cowlitz

Fish depend on a variety of interactions with other organisms and their environment. Other organisms include the food they eat, predators that eat them and pathogens—parasites, bacteria and viruses—that affect their health. Environmental influences include water temperature, oxygen in the water, available space and other factors. All of these influences affect fish survival, rate of growth, rate of reproduction and overall fish health. In the Cowlitz watershed, these factors occur in both natural and manmade settings.

Under natural conditions, balance is maintained through the availability of high-quality water, adequate cover habitat and natural checks and balances on organisms that cause fish disease. Because the hatchery environment is very different from the natural environment, maintaining healthy fish in the hatchery requires active management of both the physical environment and other organisms that the fish encounter.

In some ways, hatcheries increase the likelihood of disease. Fish are often crowded at greater than natural densities causing stress. Large groups—and with them, possibly disease—are transferred from one place to another, whether it is a rearing pond at the hatchery or a river when they are released. In addition, because so many fish depend on the same water source, the quality of that source is critical.

Hatcheries also give fish managers the ability to control disease. Environ-

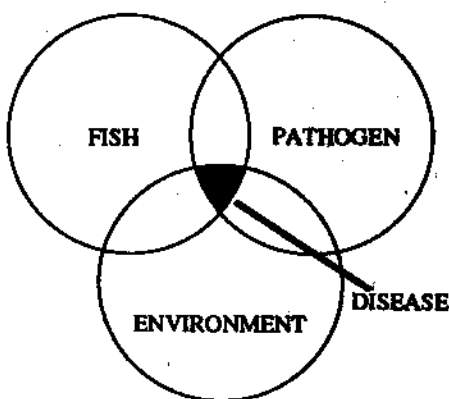
mental conditions can be monitored and changed, an advantage not present in the natural environment. Fish themselves are "managed"—their density can be controlled and they can be physically moved. Disease can be prevented through conscientious management of the hatchery environment. If disease is detected, strict precautions can be taken to control its spread. And if the disease can be treated, fish managers can control the

environment so that treatment is effective.

Specific tools at the disposal of the hatchery manager include the choice of water sources, treatment of water as it enters the hatchery, close observation of fish in the hatchery, controlling fish density to reduce stress, careful matching of appropriate fish stocks and sites for introduction and controlling passage of possible diseased adult fish above the hatchery.

In the Pacific Northwest, fish health is furthered through the Bonneville Power Administration (BPA) Augmented Fish Health Project. The Washington departments of Wildlife and Fisheries receive funding from BPA for monthly on-site examinations of all anadromous fish stocks along the Columbia River. These frequent visits by a fish pathologist lead to detection of fish pathogens before disease breaks out. Early detection assures proper preventive treatment and reduced fish mortality. The monitoring program is also providing a wealth of data which show the region's most significant fish health problems and most effective means of disease control.

In the Cowlitz, as elsewhere, fish pathogens are a naturally-occurring part of the living environment. Their presence doesn't always result in disease outbreaks. Proper awareness, the appropriate tools and teamwork among fish pathologists, hatchery staff, and biologists from all agencies are required to solve fish disease problems.



Fish disease is the result of the relationship between fish, pathogens and the environment. Changes in this relationship such as stress on fish, poor water quality or introduced pathogens change the relationship and can lead to disease.

Fish Diseases of the Cowlitz

SPECIFIC DISEASES OF THE COWLITZ

IHN (infectious hematopoietic necrosis) is a viral disease frequently found in spawning salmon and steelhead and causes death in juvenile fish and occasional large hatchery kills. The life-cycle of this virus is not fully understood and there are no known effective methods of treatment.

The major strategy against IHN is prevention. Fish managers continue to improve techniques that prevent the transmission of the disease from adults to their offspring.

If outbreaks do occur in a hatchery without a history of the disease, the infected fish may be destroyed.

Transfer of fish from a watershed (or hatchery) where the IHN virus is present to a watershed with no history of IHN is prohibited unless certain criteria are met. Such a transfer requires approval from directors of both the Department of Wildlife and the Department of Fisheries. However, if the virus is established in the hatchery, watershed or stocking

program, fish may be retained. If eggs from adult fish that test positive for IHN virus are disinfected, their offspring may be IHN-free. Continuing research on IHN aims at learning the life-history of the virus and developing effective vaccines to control the disease.

Ceratomyxosis (*Ceratomyxa shasta*) is caused by a parasite in the intestine of the fish and may result in losses up to 90 percent of a given population. Because there are no known drugs or chemicals effective against this disease, prevention is the key to disease losses. This parasite occurs in river water. The Washington Department of Wildlife and Tacoma City Light are installing an ozone treatment plant to kill the infectious stage of the parasite before it enters the hatchery and contacts hatchery fish. Experiments by Department of Wildlife biologists have shown that ozone-treated water significantly reduces mortality caused by this disease.

EIBS (erythrocytic inclusion body syndrome) is a viral disease that results in anemia, lethargy, and occasional

death in trout and salmon. This virus was only recently identified and very little is known about it. There is no known effective treatment at this time. The Washington Department of Fisheries will be performing nutritional studies at the Cowlitz salmon hatchery in an effort to understand and control the disease.

BKD (bacterial kidney disease) may cause death in spawning adults and juvenile trout and salmon. This pathogen can be effectively controlled with the antibiotic erythromycin, either injected or used as a feed supplement. A special permit from the US Food and Drug Administration is required for this antibiotic treatment. Ongoing studies on the antibiotic's potential as a standard treatment are underway. These studies are both expensive and lengthy.

Other external parasites, bacteria and fungi can also infect fish, slow their growth or cause death. Treatments typically consist of flushing appropriate chemicals through ponds where fish are being reared. Bacterial disease outbreaks are most frequently controlled by supplementing feed with antibiotics.